

Division of Comparative Medicine

The Division of Comparative Medicine (DCM) provides animal husbandry and clinical care for all research animals on the MIT campus. From its inception in 1974, the division has evolved into a comprehensive laboratory animal program that provides a full range of veterinary and surgical support. Additionally, the division has a National Institutes of Health (NIH) grant for training veterinarians for careers in biomedical research and is funded by NIH to introduce veterinary students to careers in biomedical research. The Division also has an active research program funded by numerous R01 grants from NIH. Total personnel in the division now comprises 165 individuals. The division's administrative headquarters, along with diagnostic and research laboratories, are located on the 8th floor of Building 16. This space is contiguous to the 8th floor of Building 56, which houses quarantine, diagnostic, and research space for DCM. The division now encompasses approximately 115,000 square feet devoted to animal research activities. In addition, a new 57,600 gross square foot vivarium will open in September 2005 as part of the new brain and cognitive sciences complex.

Facility Management and Animal Care

The average daily census of laboratory animals increased 10% during FY05. Mice remain the primary species used by MIT investigators and represent more than 98% of the animal population. The animal facilities support transgenic and gene "knockout" in vivo experiments. DCM now operates a transgenic core and performs a range of transgenic services, including in vivo embryo transfer for rederivation of mice with endemic disease which have been imported to MIT from laboratories worldwide, in vitro fertilization, and genotyping of mice; it also provides genetically engineered mice. The division also provides veterinary support for the large zebra fish colonies maintained at MIT. The animal resource program was recertified by the Association for Assessment and Accreditation for Laboratory Animal Care during the summer of 2002 and will be reevaluated this autumn.

Research Activities

Currently there are 14 NIH-funded grants which support in vivo study of nitrite carcinogenesis, in vivo study of *Helicobacter hepaticus* and tumorigenesis, in vivo study of the pathogenesis of inflammatory bowel disease, in vivo study of *H. pylori* pathogenesis, in vivo study of gastric cancer, studies of heat shock protein and *H. pylori* pathogenesis, study of microflora-induced colitis, studies involving diet and *H. pylori* infection, and in vivo study of microecology of the gut and the pathogenesis of colitis. Additionally, Susan Erdman received a Concept Award from the Department of Defense to study breast cancer and an NIH R01 grant for in vivo studies investigating how CD4⁺CD25⁺ regulatory cells are able to treat colon cancer. Total research expenditures were \$2.7 million in FY05.

FY05 was the 17th year of the division's NIH postdoctoral training grant. There are currently eight postdoctoral trainees, one of whom is enrolled in the graduate program in the Division of Biological Engineering. Another received his PhD from Biological Engineering in May 2005. Thirty-one trainees have completed our postdoctoral training

program and 26 of them have passed the board examination of the American College of Laboratory Animal Medicine. An additional 10 DVMs have completed postdoctoral fellowships sponsored by individual R01 or Program Project grants. Many of our former trainees hold leadership positions in academia as well as pharmaceutical and biotechnology companies. The training grant also provides short-term training opportunities for veterinary students interested in careers in comparative medicine. During FY05, the division had seven short-term trainees for periods ranging from four to 10 weeks.

DCM faculty and staff published three book chapters, 19 papers, and 24 abstracts in FY05 and presented numerous research papers at national and international meetings. Dr. James Fox is the senior editor for the second edition of a four-volume series entitled *The Mouse in Biomedical Research*.

Academic Activities

Dr. James Fox continues to serve on the NIH Scientific Advisory Council of the National Center for Research Resources and was recently appointed to the Institute for Laboratory Animal Research (ILAR) Council of the National Academy of Sciences. DCM faculty and staff taught two graduate courses in the Division of Biological Engineering (BE.202 and BE.450). Dr. Robert Marini was appointed a lecturer in the Harvard-MIT Division of Health Sciences and Technology, where he is involved in the teaching of two courses. Dr. David Schauer, who holds a joint appointment in Comparative Medicine and Biological Engineering, was promoted to professor. Dr. Fox was elected to the Institute of Medicine of the National Academy of Sciences in October 2004.

Committee on Animal Care Activities

All students, staff, visiting scientists, and principal investigators who use animals in teaching or research must be certified by the Committee on Animal Care (CAC). To enable protocol submission and personnel training, CAC's website provides required forms, continuing education material, and information about CAC activities. In conjunction with CAC, DCM staff have developed an online training program that is combined with individual orientation and training in animal use by the veterinary staff at the Institute. Periodically, individual and group didactic training sessions for Institute personnel on topics pertaining to the care and use of laboratory animals are also offered. CAC has also developed an occupational health program for animal-related occupational health issues and periodically sponsors seminars on health issues such as zoonotic diseases. CAC continued to distribute to other institutions in the United States and abroad two instructional videos, one focusing on the role and responsibilities of institutional committees for the care and use of animals and the other on the use of anesthesia in laboratory animals. Both are available to MIT researchers at the division or in the Hayden Science Library.

James G. Fox
Director
Professor of Toxicology